

REMARKS

The present amendment is submitted in response to the Office Action mailed November 30, 2001, which set a three-month period for response, making this amendment due by February 28, 2002.

Claims 16 through 32 are pending in this application.

In the Office Action, the drawings were objected to under 35 CFR 1.83(a) as not showing every feature of the invention as claimed, specifically, the stator device attached to a wiring of the printed circuit board, as defined in claim 30. Claims 17, 22, and 25 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 16-25 and 27-31 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,649,399 to Kimura et al in view of U.S. Patent No. 5,093,615 to Muto et al. Claim 32 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al in view of Muto et al and ordinary skill in the art.

Turning first to the objection to the drawings, the Applicants respectfully disagree that the figures fail to show the objected-to features. The Applicants respectfully direct the Examiner's attention to each of Figures 3 through 7. In these figures, each of the respective embodiments details an electrical connection between the circuit board 10 and the stator winding 41 of the stator device 40. The Applicants therefore submit that the features of claim 30 are clearly shown in the accompanying drawings, and respectfully request withdrawal of the objection.

With regard to the rejection of the claims as indefinite, claim 17 defines a "lead-through of the rotor shaft 51", as shown in Figure 1. The circuit board has an opening, or "leadthrough", that is appropriately sized to allow the rotor shaft to pass through it. The disclosure provides only that "a leadthrough 12 for the rotor shaft 51" is provided (see page 6, line 19). This leadthrough opening 12 is shown in the accompanying figures. However, to more clearly define this feature, the Applicants have amended claim 17 to provide that printed circuit board device has leadthrough opening, wherein said rotor shaft passes through said leadthrough to said dial. Claim 22 has been amended to adopt this language, as well.

Claim 25 has been amended to provide that the lid is attachable to a side of the printed circuit board that faces away from the dial, as disclosed on page 8, third paragraph, of the disclosure.

Looking now at the substantive rejection of the claims, the Applicant respectfully disagrees that the Kimura reference makes obvious the present invention, even when viewed with the secondary reference to Muto. Kimura does not show or suggest a shaft drive device for a dial of a gauge instrument. In addition, Kimura describes a drive in the illustrated motor, which operates on a transport band 32. However, in order to more clearly distinguish the present invention over the cited references, the Applicants have amended claim 16 to provide that the dial 8 is arranged on the rotor shaft 51. (This feature is shown in Figure 1).

In addition, it is not shown in Kimura that the circuit board has an instrument gauge. Indeed, as shown in Kimura's Figure 1, the circuit board is arranged in the interior of the housing and is not visible from outside, which indicates that no instrument gauge would or could not be used in Kimura, since it also would not be visible.

Kimura also provides no suggestion of a lid for securing the rotor and the stator to the circuit board. On the contrary, Kimura shows that the circuit board has mounting holes for receiving the coils (column 4, lines 39 through 45). Kimura also does not provide or show that the cover 53 hold the rotor or the stator, since they are both arranged to be spaced from the coils. As provided in column 4, line 49, the cover 53 is only provided for protection of the rotor.

Kimura further provides no suggestion to the practitioner that the cover is secured in the circuit board. From Kimura's Fig. 9, at the right end of the drawing, it appears only to rest on the circuit board. On the left side, a screw is shown, however, it is not apparent where this screw leads and if, overall, a threading is provided to retain the screw in the circuit board 28. In each case, the cover is not secured in the circuit board, but on the circuit board.

In addition, Kimura fails to show or suggest that the circuit board forms a frame for surrounding the motor. Kimura shows a yoke plate 38 onto which an additional boss 41 is placed, in which the shaft axis runs. The frame is therefore not formed by the circuit board but by the boss 41. The boss 41 is also used for guiding a gear 44.

From these teachings, the Applicants respectfully submit that the practitioner would not be lead to combine Kimura with the secondary reference to Muto, since Kimura provides no cause to omit the boss and to substitute an exposed enclosure, in the form of a circuit board. Instead, Kimura teaches using the boss also for guiding the gear 44. Thus, the present invention cannot be seen as obvious over the cited combination of references.

As the Applicant have argued previously with reference to claim 32, the practitioner is provided with no suggestion from either reference to arranged a dial on one side of a circuit board and the shaft drive on the other side of the circuit board, in order to save space and to created the most simple holding means possible for the motor. Muto specifically provides that all of the drive components are on one side of the circuit board and that only a support is mounted on the other side of the circuit board. Again, Kumera provides no teaching of arranging a dial on a circuit board.

Thus, the Applicants respectfully submit that claims 16-32 are patentable over these references. The Applicants further request withdrawal of the rejections under 35 U.S.C. 103 and reconsideration of the claims as herein amended.

In light of the foregoing amendments and argument in support of patentability, the Applicants respectfully submit that this application now stands in condition for allowance. Action to this end is courteously solicited.

Should the Examiner have any further comments or suggestions, the undersigned would very much welcome a telephone call in order to discuss

Amend as follows:

IN THE CLAIMS:

16. (Amended) A shaft drive device for a pointer of a gauge instrument, comprising a printed circuit board with a dial; a rotor device with a rotor and a rotor shaft attached to said rotor, wherein said dial is arranged on said rotor shaft; a stator device for driving said rotor with said rotor shaft; an attachment device for attaching said rotor device and said stator device to said printed circuit board device in such a way that said printed circuit board device forms a part of a frame surrounding said rotor shaft.

17. (Amended) A shaft drive device as defined in claim 16, wherein said printed circuit board device has a [leads through] leadthrough opening [for said rotor shaft], wherein said rotor shaft passes through said leadthrough opening to said dial.

22. (Amended) A shaft drive device as defined in claim 17, wherein said stator device is attachable to said printed circuit board device [all the way around] about an entire periphery of said leadthrough opening for said rotor shaft.

25. (Amended) A shaft drive device as defined in claim 24, wherein said attachment device has a lid which is attachable to [another] a side of said printed circuit board device facing away from said dial and which has an axial bearing bush for receiving a corresponding end of said rotor shaft.

Respectfully submitted,



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